

## AMENDMENTS TO THE SPECIFICATION

Please replace the two paragraphs in the Summary of the Invention on page 2 with the following:

--- This invention discloses the production of a uniform population of nanoreactors. The nanoreactors comprise a nanoreactor shell having a thickness of at least 0.5 nm, ~~And~~ and the nanoreactor shell envelops or encages a space. The nanoreactor shell is not perfectly single crystalline and a nanoparticle disposed within the space.

Also disclosed is a method of making a nanoreactor, comprising providing a nanoparticle, coating the nanoparticle with a first material, reacting the first material with a second material, wherein the first and second material react to form a nanoreactor shell encaging the nanoparticle. In one embodiment, the diffusion rate for the first material is different than the diffusion rate for the second material. ---

Please replace the last paragraph on page 9 and the next paragraph on page 10 with the following:

--- The material used as a nanoparticle for the nanoreactor may be elemental or a compound, or an alloy. In a preferred embodiment the material used as a nanoparticle be elemental. Metals include the main group metals, Al, Ga, In, Tl, Sn, Pb, Bi and Po; the transition metals Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Y, Zn, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, La, Hf, Ta, W, Re, Os, Ir, Pt, Au, Hg, the alkali and alkaline earth metals Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr, Ba and the semiconductor metals Ge, Si, Se,

Te. Compounds include, but are not limited to  $\text{Fe}_2\text{O}_3$ ,  $\text{TiO}_2$ , CdS, CdSe and ZnS. Alloys include, but are not limited to FeCo, CoNi and CdZn. Preferred in Pt metal.

The material used as a preliminary main material for the outside shell of the nanoreactor may be elemental or an alloy. In a preferred embodiment the preliminary main material for the formation of nanoreactors be elemental. Metals include the main group metals, Al, Ga, In, Tl, Sn, Pb, Bi and Po; the transition metals Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Y, Zn, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, La, Hf, Ta, W, Re, Os, Ir, Pt, Au, Hg, the alkali and alkaline earth metals Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr, Ba and the semiconductor metals Ge, Si, Se, Te. Alloys include, but are not limited to FeCo, CoNi and CdZn. It would not be possible to obtain structures containing carbon as the major constituent material, but various carbon nanostructures, including diamond nanoparticles or carbon nanotubes may be utilized as the starting material and reacted with other species to obtain carbon-alloyed nanoreactors, for example nanospheres of steel may be synthesized by reacting a diamond nanospheres with a suitable iron source. This resulting structure will be chemically and crystallographically very different from sheet-like structures such as buckminsterfullerenes or carbon nanotubes. Halogens and noble gases are not suitable. One having ordinary skill in the art will appreciate that the stability and reactivity of the preliminary main material in solution and under reaction conditions will impact on the success of the present method and the quality of the nanoshell derived therefrom. For example, alkali earth metals are less stable and would require more stringent reaction conditions for success. ---

Please insert the following paragraphs between the first and second full paragraphs on page 11 (The second paragraph begins: "In accordance with the present invention, the mobilities of the reacting species, the first material i.e. the preliminary main material and the second material are not necessarily chosen such that they are drastically.") :

--- In one embodiment the nanoreactor shell comprises a binary or ternary compound, wherein said binary and/or ternary compound comprises a first material and a second material, wherein the first material comprises a material selected from the group consisting of Pt, Zn, Co, Fe, Ti, Cd, Hg, Mg, Ga, In, Al, Ni, Sn and Bi; and the second material is selected from the group consisting of S, Se, O, P, N, F, Cl, I, Br, As and Sb.

In another embodiment the second material comprises a material chosen from the group consisting of S, O, Se, Te, P, N, As, Cl, I, Br and Bi. ---